

Date: Fri, 5 Nov 93 04:30:41 PST  
From: Ham-Space Mailing List and Newsgroup <ham-space@ucsd.edu>  
Errors-To: Ham-Space-Errors@UCSD.Edu  
Reply-To: Ham-Space@UCSD.Edu  
Precedence: Bulk  
Subject: Ham-Space Digest V93 #77  
To: Ham-Space

Ham-Space Digest                      Fri, 5 Nov 93                      Volume 93 : Issue    77

Today's Topics:

Nice listing of all sats???  
Oscar 21 Question  
SAREX STS-58 QSL Cards  
STS-58 SAREX signal strength

Send Replies or notes for publication to: <Ham-Space@UCSD.Edu>  
Send subscription requests to: <Ham-Space-REQUEST@UCSD.Edu>  
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Space Digest are available  
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-space".

We trust that readers are intelligent enough to realize that all text  
herein consists of personal comments and does not represent the official  
policies or positions of any party. Your mileage may vary. So there.

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Date: 3 Nov 1993 13:02:17 GMT  
From: yeshua.marcam.com!news.kei.com!bloom-beacon.mit.edu!mojo.eng.umd.edu!  
tedwards@uunet.uu.net  
Subject: Nice listing of all sats???  
To: ham-space@ucsd.edu

I was wondering if someone has a text file which is a listing of  
all amateur satellites with uplink and downlink frequencies.  
It's a little tough trying to keep up with all the new sats and  
operating changes in old ones.

-Thomas

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Date: 4 Nov 1993 13:08:36 -0500  
From: gulfaero.com!not-for-mail@network.ucsd.edu  
Subject: Oscar 21 Question  
To: ham-space@ucsd.edu

I have just recently started listening in on Oscar21 passes on 145.983 MHz. Could someone please explain the 'mode flipping' between QSOs, German, French, etc 'broadcasts', and packet? I'm trying to learn the ropes before attempting contacts and I do intend on reading up on the subject. However, I'm running long on curiosity and short on time for researching my new-found habit.

Your help is appreciated.

Regards,  
John KE4GHE

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Date: 4 Nov 93 14:17:53 EST  
From: psinntp!arrl.org@uunet.uu.net  
Subject: SAREX STS-58 QSL Cards  
To: ham-space@ucsd.edu

STS-58 QSL cards should be sent to ARRL, SAREX STS-58 QSL, 225 Main Street, Newington, CT 06111.

To receive a QSL, include the QSO information (e.g. date, time in UTC, frequency, mode) which documents the contact or listener report. In addition you must also include a SASE using a large (9 x 4), business sized envelope if you wish to receive a card. No cards will be distributed without the proper postage affixed or sufficient IRCs included. Please expect a lengthy (6-10 month) wait after the mission to receive your QSL card. Development of a SAREX QSL card can be a very lengthy process.

Congratulations on working (or hearing) Space Shuttle Columbia and the astronaut-crew during STS-58!

Posted by:  
Robert J Inderbitzen, NQ1R | voice: (203) 666-1541 X213  
Educational Activities Department | fax: (203) 665-7531  
American Radio Relay League | email: rinderbi@arrl.org  
225 Main Street | ARRL BBS: (203) 666-0578  
Newington, CT 06111 USA | CompuServe: 70007,3373.

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Date: 5 Nov 93 01:52:59 GMT  
From: cs.utexas.edu!TAMUTS.TAMU.EDU!gerry@uunet.uu.net  
Subject: STS-58 SAREX signal strength  
To: ham-space@ucsd.edu

Well, I've been following this thread with some interest. Thought maybe I could shed a little light on the antenna, and some of the problems associated with the signal strength question, and also about frequencies.

The antenna is an annular slot design which is placed within a reflecting cavity. The cavity is mounted to a ground-plane that is the size and shape of the window it is placed in, either W1 or W6, corresponding to the windows to the left of, and behind, the Commander, and to the right of, and behind, the pilot. The ground plane is reversible, held to the cavity with suitcase latches, and is oriented appropriately for the selected antenna. It requires about 3 minutes on the ground, and between 1 and 5 minutes in microgravity to accomplish the reversal.

The antenna can be tuned, although the tuning mechanism is pretty coarse. A knob controls a "finger" of metal that varies the coupling between the radiating element and the cavity. A permanently mounted reflected power meter provides indication of appropriate tuning. The meter indication is relative. There is no known correlation that we can produce that routinely tells ANYONE what the SWR is, so we train the crew to tune for a minimum reading, which WILL occur within 90 degrees of rotation. Because of uneven thermal expansion, the antenna should, technically, be retuned whenever it is in full sun or full darkness. Whether the crew does this depends on how busy they are at the time. The coarse nature of the tuning mechanism makes tuning a bit time-consuming.

The radio is a Motorola MX-300 series synthesized handheld. It has 48 predetermined channels, the contents of which were determined by AMSAT to attempt to not bother the myriad of other users in the 2 meter band worldwide. Sometimes we're even successful. Although there was a hue and cry before, during and after STS-35 about "occupying" some "assigned" packet frequencies, it should be pointed out that, SAREX predates packet, SAREX is only operational 3-6 times a day for 9 minutes a pass (geocentric basis of comparison), and the frequencies were not recognized in the ARRL bandplan in use at the time of STS-35, OR STS-37. We've made some attempts to work with the interested parties, and hopefully the amount of interference between services and modes will be limited.

The radio is running about 2.5 watts. It was derated to provide an adequate signal level, without increasing the amount of electromagnetic interference (EMI) within the crew compartment. We worked long and hard to meet stringent standards concerning EMI and electromagnetic compatibility (EMC) that are the bane of all Shuttle experiments. KB5ARA was the engineer who made a LOT of the measurements, and who made most of the recommendations concerning modifications and waivers (the few) to make the system work.

The deviation is reduced to 2.5 khz. This is about to generate a lot of heat and light. Remember that we're prone to analyze everything to death, and we did just that. 2.5 khz deviation makes sure that the crew will not go outside

of your commercial ham rig's passband because of doppler shift. Sure, we know their deviation is low. We set it that way. Oh, yes... If the packet community were to set their deviation as we did terrestrially, they'd see a lot less hash on the band from overdeviation and harmonic generation... TAPR suggested diminished deviation a while back, if memory serves...

There have been 2 missions in the history of Amateur Radio in Space (US, abridged) where an external antenna was used. Spacelab D-1 and D-2. SAFEX, the German version of SAREX used their antenna mounted on the aft endcone of the Spacelab Module for both missions. I understand there's some lore associated with the original mounting of that antenna, but that's for another story. On STS-55/D-2, SAREX also used the antenna. In fact, we did a real experiment (you know, prior planning, a hypothesis, testing, data collection, reduction, and analysis, and then a report...) Kai Siwiak, KE4PT, put that little exercise together. He reported significantly better results with the external antenna than the window antenna, even when differences in the spacecraft position, pointing, and orbit were accounted for. We've been scheming about a real external antenna, and are currently STILL talking about it. No details now. If and when there are, I'm sure Frank Bauer, KA3HDO, will fill everyone in.

Window-mount antennas... I realize that it was mentioned in jest, but we've looked at changes to the antenna system. Including window mount antennas. Of course, getting the appropriate glass just to test prototypes is almost impossible, as NASA can still use damaged panes for training and real testing, beyond SAREX's requirements. The multi-pane design of the Orbiter's windows, using specially treated silica glass in each pane, makes it problematic to "just get a piece" as we recently tried to do. Since they make one pane out of a single ingot of glass (or whatever you really call it). And since they're about 3 inches thick, neither Larsen, nor Antenna Specialists will guarantee that their systems will move RF across it. Never mind the fact that we cannot attach anything to, nor touch anything to! the windows except some specially prepared O-ring gasket material, that we had to buy 150 feet of for the 2 flight antennas.

Crew training is now the purview of the folks who are still at JSC (the Johnson Space Center). I'm too far to have much real impact on it now. Typically, the crew has up to 10 sessions of hands-on training with the hardware, plus some time on HF and VHF with a mentor, to get the hang of operating practice. Then, they're instant experts in ham radio. From where I sit, they've done a great job of being placed in a group of "eccentric" individuals, and performing well. I'm pretty proud of 'em. And of the current training team.

I'll be willing to try to answer any questions directed to me via e-mail. For the record, the information espoused herein is from memory, and several years of working on the project. It's not been checked and approved with the powers-that-be. It is as accurate as I can recall.

Frank bauer, KA3HD0, is the official spokesperson for AMSAT, and SAREX. During the missions with SAREX onboard, Frank attempts to keep everyone abreast of the developments onboard, and ship things out via packet radio and internet as quickly and in as timely a manner as possible. Since I can speak for myself, I can say that I wasn't always too good at getting everything to Frank as it happened... but I can be trained.

Hope this helps. Again, queries by E-mail will be answered. Enough similar questions and I'll summarize a response here.

73, Gerry Creager N5JXS  
SAREX Co-Investigator

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Gerry Creager N5JXS	* SAREX Co-Investigator
gerry@cs.tamu.edu	* A little radio that lets kids talk
gcreager@gothamcity.jsc.nasa.gov	* astronauts, and smile

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